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include some additional species, but the Cyperaceae (19 genera and 97 species, 6 of which are new), Rubiaceae (16 genera and 36 species, 11 of which are new), and Filices (39 genera and 86 species, 18 of which are new) are presented with a measure of completeness. Aside from these families, the largest additions of new species are to Ericaceae (14), Euphorbiaceae (12), and Musci (10).—J. M. C.

Paleobotanical literature.—The third volume of JONGMAN'S *Die palaeobotanische Literatur* has appeared,⁶ including the bibliography of 1910 and 1911. The great usefulness of this publication needs no explanation, and now that paleobotany has come to be an essential part of the morphology of vascular plants, it will serve a much larger group of botanists than the title once would have indicated. The list of authors (40 pp.) includes 374 names, representing 762 titles. The list of literature is admirably organized, so that almost any clue can be followed to the literature of a subject.—J. M. C.

NOTES FOR STUDENTS

The mucors.—Prominent among recent publications on the Mucoraceae are two papers by HAGEM⁷ which deal with the distribution, taxonomy, and physiology of the soil-inhabiting mucors occurring in the vicinity of Christiania, Norway. A systematic search has revealed the presence in the soil of an unsuspected wealth and variety of these organisms, strangely in contrast with the rarity of their spores in the atmosphere. In the first paper, which deals with taxonomy and distribution, 20 species are described. Of these, 16, including 7 new species, were isolated from cultivated and forest soils. Most of these were isolated many times and some were present in remarkable abundance. Among the most frequently encountered species, *Mucor racemosus*, *M. hiemalis*, and *M. nodosus* are abundant in cultivated lands; *M. Romannianus* is most frequent in coniferous forests (50,000 spores per gram of soil), but *M. strictus*, *M. flavus*, and *M. sylvaticus* are also common. Some forms like *M. racemosus*, *M. hiemalis*, *Absidia Orchidis*, and *Zygorynchus Moelleri* are widely distributed both in cultivation and in forest soils. As showing the rarity of the spores of mucors in the air, only 8 species were isolated by means of Petri dishes containing culture media, and exposed for periods of 1–2 hours both in town and country.

The second paper deals chiefly with problems of nutrition. A large number of compounds were tested with respect to their availability as sources of

⁶ JONGMANS, W. J., *Die palaeobotanische Literatur*. Bibliographische Übersicht über die Arbeiten aus dem Gebiete der Palaeobotanik. Dritter Band. Die Erscheinungen der Jahre 1910 und 1911 und Nachträge für 1909. pp. 569. Jena: Gustav Fischer. 1913. M 26.

⁷ HAGEM, O., *Untersuchungen über norwegische Mucorineen*. I. Vidensk. Selsk. Skrift. no. 7. pp. 50. figs. 22. 1907; *ibid.* II. no. 4. pp. 152. 1910.